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It is evident then that the *Upper Freeport coal bed* in this region will yield a coke which is not appreciably inferior to that made at Connellsville, Pennsylvania.

Few details were gathered respecting the general section exposed along the slope of Laurel ridge, as all detailed work was stopped by a severe snow storm. A bed of cannel was seen at not far from 165 feet above the *Upper Freeport*. On one side of Sandy creek, this bed shows 4' 8" of cannel, but on the other side of that creek it shows no cannel, and contains only bituminous coal, 3' 6" to 4' thick. The cannel was worked many years ago for distillation of oil, but the works were abandoned on the discovery of petroleum.

The Freeport limestone is present at from 40 to 50 feet below the *Upper Freeport coal bed*, and is exposed at one locality nearly three miles north from the railroad. It is 3 feet thick, and rests on a bed of iron ore, which is 30 inches thick and very persistent. This ore was mined at one time both by benching and drifting, and the material was sent to the Irontown furnace, where it produced a foundry iron. It is too cold-short for use alone, and to be available must be mixed with some ore containing little or no phosphorus. A small coal bed rests on the limestone, and another, about 2 feet thick, is shown at nearly 70 feet lower.

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*Memoir of S. S. Haldeman, A. M., Ph. D., etc. By D. G. Brinton, M. D.*

(Read before the American Philosophical Society, February 4, 1881.)

In presenting a sketch of the life of the late Professor Haldeman, I shall begin with his personal history, and then proceed to give a brief account of his contributions to science.

Samuel Stehman Haldeman was born August 12, 1812, at Locust Grove, a beautifully situated country-seat on the east bank of the Susquehanna river, twenty miles below Harrisburg. The house, with the extensive property surrounding it, had been in the possession of his ancestors for several generations.

The family came originally from Thun, in German Switzerland, and were an energetic, independent race, who had been honored in their day. Jacob Haldeman, a great-grandfather of the subject of this memoir, was chosen one of a Committee of Public Safety from Rapho township, Pa., in revolutionary times. Frederick Haldimand, a great-uncle who had entered the English military service, became first Governor-General of Canada under that rule. John B. Haldeman, a grandfather, was member of the General Assembly from Lancaster county, in 1795. The name was formerly spelled with either *i* or *e* in the second syllable and the final *d* rejected or retained according to the language of the canton in which it was found, but as it was of Germanic origin, Prof. Haldeman always used the German method.

He was the oldest of seven sons, his parents being Henry Haldeman (1787-1849) and Frances Stehman (1794-1826). His father, a lover of books, endeavored to foster in this, his favorite child, a desire for learning, and to impress upon him its importance. His mother, a lady of attainments, dying when he was but twelve years old, had but little influence upon his after career, except perhaps that his great accuracy in detecting and analyzing unusual sounds in language may have been inherited from her who was an accomplished musician. His early education was pursued at the local schools, supplemented by a good library at home. The favorable opportunities for the observation of nature which presented themselves he improved by forming a boyish museum containing rude anatomical preparations made from rabbits, opossums, muskrats, etc., and of birds, which a traveling Methodist preacher had taught him how to stuff. An extract from a letter to a friend, dated 1844, contains these words, "I collected shells on the banks of the Susquehanna long before I knew the meaning of genus and species."

In the spring of 1826, when nearly fourteen years of age, Mr. Haldeman was sent to the Classical Academy of Dr. John H. Keagy, at Harrisburg, Pa., a gentleman of whom he always spoke as being an able thinker and thorough scholar. An assistant teacher, Mr. J. T. Q. Mittag, who is yet living at an advanced age, refers with enthusiasm to the precocity and studious habits of his pupil at that time.

He remained at Harrisburg two years, and then went to Dickinson College, Carlisle, Pa., where his taste for natural science was encouraged by Prof. H. D. Rogers, subsequently the distinguished geologist. But his early freedom and the bent of his own sturdy genius made the restraints of a college course irksome, and after two years he left Carlisle without waiting to obtain a degree and with the intention of pursuing his studies alone. In fact, the lack of thorough teaching in his youth had given him a rooted distrust for the opinions of the masses, and had formed habits of self-reliance which forced him to be original or nothing. "I cannot learn from others, I must see for myself," he would impatiently exclaim, and thereupon would proceed to investigate an assertion with a series of cross-examinations such as were well calculated to develop the exact truth. In after years, to see some poor native under the fire of his questions, when the pronunciation of an *a* or an *u* was at stake, was almost painful. His horror of compilers was such that once when returning from Europe, being reproached for having written such short letters "when seeing so much to write about," he characteristically referred the speaker to an excellent work on European travel, saying that as everything had been well described there, it was not worth while to repeat it.

Thus at the age of eighteen he began to direct his own studies and to accumulate at the paternal mansion cabinets of geology, conchology, entomology, botany and a scientific and linguistic library. As the bias of local opinion rendered it necessary that all young men who were not professional should go into business, he assisted his father in conducting a saw-mill on

a newly acquired property, called at that time Chickiswalungo. The young student found business even more tedious than college routine, and relates of himself at this time, "I developed a taste for rainy weather and impassable roads; then I could remain undisturbed in the perusal of my books, a supply of which I kept in a back office, where I retired as soon as the sky looked threatening." This taste for rainy days was not fictitious and remained with him during his life.

In 1835, Mr. Haldeman married Miss Mary A. Hough, a lady whose eminent qualities and devotion to his interests greatly aided to render his after success possible. Ably taking upon herself those cares which a growing family entail, she left him leisure for the pursuit of his favorite projects, and it was in consequence of her wish that he wrote his essay on *Analytical Orthography*, which, though not more important than his other works, gained him an European reputation.

Shortly after his marriage, Mr. Haldeman, with his wife, occupied the residence built for him by his father at Chickies, and became a silent partner in the iron business conducted by his brothers, Dr. Edwin and Paris Haldeman. Here books and cabinets accumulated under his laborious hands, only to be scattered again and give place to others when his insatiable appetite for knowledge led him into new fields of investigation. For forty-five years he spent most of his time in his library, where in his vigorous manhood he worked sixteen hours a day. For though he accepted several professorships and delivered a number of courses of lectures, he did so with reluctance, preferring to be master of his time and to spend it in the quiet of home.

In person, Mr. Haldeman was of middle height, with small, well formed hands and feet, a large and remarkably round head, giving great breadth across from ear to ear; high forehead, Roman nose, full lips, black eyes, and in youth a quantity of black hair, which at his death was of snowy whiteness. Long before it was usual in America he wore a moustache and beard, not for adornment but for convenience. In speaking, he had a clear enunciation, penetrating voice, and much readiness at repartee. His movements were rapid, his disposition cheerful, his general health excellent, and his interest in science unflagging to the end of his life, his latest occupation for leisure moments being the forming of an archæological collection, in which he took great pleasure, and the advancement of the spelling reform.

His death took place suddenly at seven o'clock, Friday evening, September 10, 1880. On returning from the meeting of the American Association for the Advancement of Science, held at Boston, August 23d, he complained of fatigue, but insisted on occupying his library as usual. A physician being sent for advised rest, but it was only on Friday morning that he could be induced to keep his bed. The physician paid him a long visit on Friday afternoon, and Mr. Haldeman conversed cheerfully for about an hour; only once he complained of weakness, and fixing his eyes on the doctor, asked, "Do you think this could be the breaking up of my sys-

tem?" but seemed satisfied when the doctor, surprised, answered "No." A few hours afterward, having risen from his bed without assistance, his son, who was in the next room, heard a fall; in a moment he was by his side and had taken him in his arms, but though every means was resorted to that animation might be restored, life had departed. Death was occasioned by a disease of the heart, to which he had some hereditary predisposition.

I may add to the above some personal reminiscences illustrating Prof. Haldeman's character, communicated to me by Prof. E. A. Barber, of this city.

Like most men of high impulse and native truthfulness, it was difficult for him to suspect deceit in others. On one occasion he showed Prof. Barber a small stone ornament shaped like a fish, and enthusiastically described it as one of the "finds" in the famous "Chickies rock retreat." With some hesitation his auditor pointed out certain suspicious marks about it, and suggested the possibility that it had been manufactured by one of the boys engaged in the excavation. For the first time the idea of such an imposition crossed his mind, and further investigation led to a confession of the act by the perpetrator.

It was his taste and apparently also his theory that a student should not be a specialist, but should devote his mind to different branches, thus securing wider knowledge. In a conversation with Prof. Barber, he once said: "I never pursue one branch of science more than ten years, but lay it aside and go into new fields."

As a correspondent, he wrote frequent letters, but brief ones, and generally was an enemy to prolixity. In one of his letters he writes, "You may think the enclosure rather short, but I dislike palaver, and like to say my say, then stop."

This trait shows itself in his writings. His style is terse and nervous, and his matter shows constant evidence of careful arrangement, so as to secure the utmost condensation compatible with clearness.

Professor Haldeman's religious views were fixed for many years before his death. Born of Protestant parentage, he was led in early life to doubt the theology which he heard taught in the schools and preached in the pulpits of Central Pennsylvania, and for a term of years did not attach himself to any sect or church. Later on he took up the systematic study of the evidences of religion, convinced that this is a subject on which every man of intelligence should have definite and defensible convictions. The result of his studies was that he united himself with the Roman Catholic Church, which he stated he had found to be the earliest historic form of Christianity, and he remained a consistent member of that confession until his death.

Early distinguished as a devoted student of natural science, Prof. Haldeman was selected to fill various public positions as an expert and a teacher. In 1836 he was chosen an assistant in the New Jersey Geological Survey, and the following year held a similar office in Pennsylvania, and

prepared a work on the geology of that part of this State lying between the Blue mountain and South mountain, from the Delaware to the Maryland line, which was published May 1st, 1837. While engaged in this occupation he discovered the *Scolithus linearis*, the oldest fossil then known. In 1851 he became Professor of Natural History in the University of Pennsylvania; in 1855, in Delaware College, acting also as Professor of Geology and Chemistry to the State Agricultural College, and subsequently became Professor of Comparative Philology in the first-named institution, when that chair was first established, and filled it continuously up to the time of his death.

Turning now to his record as an author, we find Professor Haldeman displayed amazing activity in a variety of branches. In his earlier years natural history was his passion, while in his later life linguistics and archæology occupied most of his attention.

The first work which I can find assigned to him was "Fresh Water Univalve Mollusca," published in 1840, 2 vols., 8vo, which is now out of print. This book is very scarce and it is difficult to obtain a copy, the last one that was sold bringing thirty dollars; in 1842 he published "Zoological Contributions;" in 1847 he issued a work on the "Genus *Leptoxis*," in French, while on a visit to Paris. It is part of the *Illustrations Conchologiques* of Dr. Chenu. In 1849 he issued his first philological work, entitled "Some Points in Linguistic Ethnology," dealing with English languages, and from that date he became recognized in the scientific world as one of the leading philologists.

In 1850 he published a work, "Zoology of the Invertebrate Animals;" in 1851, "Elements of Latin Pronunciation;" in 1855 he edited "Taylor's Statistics of Coal;" in 1856, a work on the "Relations of the English and Chinese Languages;" in 1864 he issued a work on the game of chess under the title of "Tours of a Chess Knight;" and in 1868, the "Rhymes of the Poets," under the *nom de plume* of "Felix Ago;" in 1871 he issued a work on "Affixes to English Words," and in 1877, his last work, entitled "Outlines of Etymology," was published.

The Professor leaves behind him a complete work on "Word Building," which is designed for the use of classes in Etymology, and which is ready for the printer; also a work on "English Prosody." He also leaves the manuscript of "Rat and River—a Tale of the Ohio," a mock heroic poem, and a poem of the same kind entitled, "Flight of the Fishes."

In addition to these works he has contributed probably one hundred and fifty papers on various scientific subjects, especially relating to Geology, Conchology, Entomology, Philology, and several branches of Zoology, which have been published in the Proceedings of the American Association for the Advancement of Science, the American Philosophical Society, American Philological Association, Academy of Natural Sciences, and many other learned societies of which he was a member. This Society is now publishing in their Transactions a monograph on "Contents of a Rock Retreat in Southeastern Pennsylvania," which is descriptive of the

Indian arrow heads and other relics found in the cave under Chickies rock. He was the first editor of the Pennsylvania "Farmers' Journal," a contributor to "Silliman's Journal," the "Iconographic Encyclopædia," the "Literary World," and Johnson's Cyclopædia.

Of the latter he was also an associate editor of the Comparative Philology and Linguistic department, and was the author of numerous articles in it. He also wrote two or three manuals of orthography, pronunciation and etymology, and his treatise on "Analytical Orthography," consisting of investigations into the philosophy of language, gained him, in 1858, the highest Trevelyan prize over eighteen competitors. He wrote the zoological portion of Trego's "Geography of Pennsylvania" (1843), and Rupp's "History of Lancaster County" (1844).

I have endeavored, without success, to prepare a complete list of these numerous papers, and must content myself with the above general references to them.

In conclusion, I wish to present an appreciative tribute to Prof. Haldeman's scientific attainments from the pen of his personal friend and our much esteemed member, Dr. John L. LeConte.

"Next to his valuable contributions in Philology, the most important work of Prof. Haldeman was in the direction of descriptive Natural History. He was well versed in several branches of Zoology, and notably in Conchology and Entomology; in both studies he perceived latent possibilities of future philosophical development, which the then imperfect observations rendered impossible to do more than dimly outline. This quality is especially noticeable in remarks scattered through his monograph of Fresh Water Univalves of the United States, and in a memoir;\* 'Enumeration of the recent fresh water Mollusca, which are common to North America and Europe, with observations on species and their distribution.'

"Without being a partisan, any more than myself, in the scientific squabble which then provoked much bitterness of expression between the contending factions, but which has since dwindled into comparative insignificance—the single or multiple origin of man—we held frequent conferences upon the subject. And in these friendly talks, I have heard him express himself freely on the impossibility of the results of the naturalist (now the biologist), being ever acceptable to the adherents of the scholastic school, 'For,' said he, 'if it be proved that organic forms are invariable during their continuance upon earth, then the different human races must be considered as having originated independently. If on the other hand, organic forms are plastic, under circumstances not yet understood, then the present species may have been developed from species which preceded them, and have not resulted from direct creative acts. Either horn of the dilemma is unsatisfactory to the metaphysical views prevalent.'

"While his contributions to the two branches of Zoology above mentioned have contributed to their advance in this country, what are especially to be admired are the zeal, the honesty of expression, and the unselfishness

\* Boston Journal of Natural History, vol. iv, p. 468.

with which he did everything he believed to be right, or to be his duty as the occasion dictated.

“When in affluence, his contributions for the promotion of science were liberal. When in moderate circumstances, he pursued with equal industry such subjects in science as required small expenditure. But at all times he was an industrious and intelligent laborer, a warm and sympathetic friend, and a thorough hater of pretence and empiricism.

“Failing eyesight compelled him eventually to give up his studies in Zoology, and to devote his whole time to Linguistics, for which he had exhibited a growing taste for several previous years.

“The rare flexibility of his vocal organs gave him peculiar facility for analyzing and imitating the sounds in foreign languages, which he never lost any opportunity of hearing in his travels, both in this country and in Europe. In this matter his Natural History training in accurate observation, aided by remarkable perceptive qualities, gave him great advantage, and I am convinced that his analysis of the causes of change of sound in words, in passing from one language to another, will hereafter receive much more attention than they have heretofore done in this, the country of his birth, where such investigations are still in their infancy.”

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*Stated Meeting, February 18, 1881.*

Present, 12 members.

President, Mr. FRALEY, in the Chair.

A letter acknowledging Diploma was received from A. Akerman, dated Stockholm, Jan. 16, 1881.

A letter requesting missing numbers of the Proceedings was received from the Rhode Island Historical Society, February 14, 1881.

A letter respecting the third part of Transactions, Vol. XV, was received from E. A. Barber, 4008 Walnut street, Philadelphia, February 14, 1881.

Letters of acknowledgment were read.

Donations for the Library were received from the Mining Surveyors at Melbourne; the Zoologischer Anzeiger; the Academia dei Lincei; the Academy at Brussels; M. Delesse; the Revue Politique; London Nature; Journal of Forestry; Mr. T. S. Brown, of Montreal; Essex Institute; Poughkeepsie Society of Natural History; Mr. B. A. Hinsdale; Penna.